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atherosclerosis (ath'er-o-skler-o'sis)

Arteriosclerosis characterized by irregularly distributed lipid deposits in the intima of large and medium-sized arteries, causing narrowing of arterial lumens and proceeding eventually to fibrosis and calcification; lesions are usually focal and progress slowly and intermittently. Limitation of blood flow accounts for most clinical manifestations, which vary with the distribution and severity of lesions. In lower animals, *a.* of swine and fowl closely resemble human *a.*. SYN: nodular *sclerosis*. [G. athere, gruel, + sclerosis] Atherosclerosis, the most common form of arteriosclerosis, is a complex process that begins with the appearance of cholesterol-laden macrophages (foam cells) in the intima of an artery. Smooth muscle cells respond to the presence of lipid by proliferating, under the influence of platelet factors. A plaque forms at the site, consisting of smooth muscle cells, leukocytes, and further deposition of lipid; in time the plaque becomes fibrotic and may calcify. Expansion of an atherosclerotic plaque leads to gradually increasing obstruction of the artery and ischemia of tissues supplied by it. Ulceration, thrombosis, or embolization of a plaque, or intimal hemorrhage and dissection, can cause more acute and severe impairment of blood flow, with the risk of infarction. These are the principal mechanisms of coronary artery disease (arteriosclerotic heart disease with or without heart failure, angina pectoris, myocardial infarction), peripheral vascular disease (particularly occlusive disease of the lower extremity causing intermittent claudication or gangrene), and stroke (cerebral infarction due to occlusion of carotid or intracranial arteries). Independent risk factors for atherosclerosis are male sex, advancing age, the postmenopausal

state, a family history of atherosclerosis, cigarette smoking, hypertension, diabetes mellitus, elevated plasma LDL cholesterol, elevated plasma homocysteine, overweight, and a sedentary life-style. Mounting evidence suggests that elevation of plasma levels of triglycerides, fasting insulin, fibrinogen, apolipoproteins A and B, and lipoprotein (a) are also independent risk factors. The diagnosis of atherosclerosis is usually based on history and physical examination and confirmed by angiography, Doppler ultrasonography, and other imaging techniques. Treatment is largely mechanical: balloon stretching, laser ablation, or surgical removal of plaques, and various bypass and grafting procedures. The prevention of atherosclerosis is a major objective of modern medicine. Preventive measures include regular vigorous exercise, a diet low in fat and cholesterol, maintenance of a healthful weight, avoidance of tobacco, and use of pharmacologic agents as indicated (e.g., rigorous control of hypertension and diabetes mellitus, reduction of elevated cholesterol, estrogen replacement therapy after menopause). See free radical; low-fat diet.